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STEPHEN PRESTON RUGGLES.

Stephen Preston Ruggles was born in Windsor, Vt., July 4, 1808. He was a descendant of Thomas Ruggles, who emigrated from Nazing, Essex, England, to Roxbury, Mass., in 1637. As a schoolboy he showed his predilection for mechanism by inventing and building several little machines, which arrested the attention of the mechanics of the neighborhood; one of these was a rotary pump, which, though rudely built, worked with great efficiency.

Apprenticed at the age of fifteen to a printer, he soon began to devise means of improving the printing-press. His first successful attempt was the invention of a self-acting roller to ink the types of a hand-press; although the apparatus had been constructed in the cheapest possible manner, it worked well and silenced the jeers and laughter of those who had opposed the plan.

About this time stereotype plates began to be used. Although the process of stereotyping was a profound secret, and he was ignorant even of the existence of such a material as plaster of Paris, of which the moulds are made, yet he succeeded in producing casts of wood engravings, and of type, of a very satisfactory character.

In 1826 he came to Boston an entire stranger, with less than three dollars in his pocket. He, however, found employment, and soon after built with his own hands the first cylinder power-press ever constructed in this country.

He next invented a double-frisket bed and platen press, and built a complete working model, which was exhibited during the summer of 1827. This same year he built the first belt or band saw ever used. He, however, neglected to take out a patent, and it was subsequently patented by others, and is now in successful operation in all parts of the country.

From 1827 to 1832 he invented a new ruling-machine for the use of engravers, and the first card or job press that was, probably, ever constructed; he succeeded by this press in printing upon dry, polished, or calendered paper without wetting it, and without making any impression in the paper.

In 1833 Mr. Ruggles took charge of the printing at the Perkins' Institution for the Blind. The following extracts from the "American Cabinet and Boston Athenæum" of Dec. 1, 1849, give an idea of the difficulties encountered in his new task.

The books for the blind, as they were then made in Europe, were bulky and unwieldy, as well as costly; with quick perception he very soon ascertained that he could produce a type of less size and less height of face, which the blind could read as well, if not better, than the old-fashioned kind. He accordingly altered the size, the height and bevel of the face of the type repeatedly, each time taking impressions and practising reading with the blind pupils till he informed himself accurately what they could read best. By these experiments he made himself acquainted with the important fact, that, if the type were comparatively small and the face but slightly raised, they could be read with ease and rapidity, provided the raised impression on the paper was hard and sharp.

Having prepared the type, he now commenced printing, and after many trials and experiments with the strongest printing-presses in use, and after breaking two of them without succeeding in obtaining such an impression as he required, he was obliged to invent and build a more powerful press of an entirely new construction. This new press he so contrived that it could be worked by the blind; and, while it gave a pressure of three hundred tons at each impression, would at the same time throw off work at the rate of eighteen sheets per minute, thus working about as fast as the ordinary newspaper power-presses.

After succeeding in the construction, both of his type and press, a new and unexpected difficulty presented itself.

There was no paper to be found properly adapted for the purpose of this kind of printing or embossing. That which was hard enough would break through, and be rough, when embossed or printed; and that which was flexible enough not to crack or break through would flatten down when pressed upon by the fingers of the reader. However, after many experiments on the manufacture of paper with gums, resins, and gelatine, he produced a paper stiff and hard, like parchment, that would receive a sharp and distinct impression, that would stand firm and unyielding when pressed by the fingers, and that would not break or crack under the pressure of the press.

After perfecting the new method of printing books, Mr. Ruggles next invented a new method of making *maps* for the blind, which proved eminently successful. This he accomplished by a raised character similar to his type, but arranged with such combinations that at a trifling expense he could produce a succession of maps of any size and of any country. Maps made in this manner were never before known, and the Perkins Institution in Boston immediately issued an "Atlas of the United States, and a General Atlas."

We cannot in this brief notice call attention to all of Mr. Ruggles's valuable improvements for facilitating the education of the blind, but much of the school apparatus now in use is his invention.

In 1838 he resigned his position at the Perkins Institution, and from that time devoted himself to his inventions. These included improved forms of printing, stamping, and punching presses; machines for cutting paper, cards, and sheet metal, for planing stereotype plates, and for laying out the teeth of gear wheels; improvements in hand-stamps, couplings for shafts, a new form of steam generator, a registering dynamometer, a gas regulator, etc. For these inventions he has received no less than nine medals of bronze, silver, and gold from different corporations in recognition of his extraordinary mechanical achievements.

Mr. Ruggles earnestly advocated the establishment by the state, city, or by an endowed corporation, of what he called "Developing Schools and School Shops," in which a boy after leaving the common school should be taught that trade, art, or calling for which he is best fitted by nature; the object of the developing school being to ascertain by actual experiment, in a series of miniature workshops, the occupation best adapted to the capacity of the pupil.

Mr. Ruggles also advocated the establishment of a "Museum of Mechanism" for the use of students and inventors, which should contain a complete collection of kinematic models, as well as types of important machines. These two projects occupied him exclusively for the last years of his life up to the time of his death, which took place at Keene, N. H., May 28, 1880.

Mr. Ruggles was always greatly interested in technical education, and was ever ready to aid in perfecting the apparatus for instruction in applied science.

LOUIS F. DE POURTALÈS.

Louis F. de Pourtalès was born in Neuchâtel on the 4th of March, 1824, and died at Beverly Farms, on the 17th of July, 1880, in the fifty-seventh year of his age, sinking after a severe illness under an internal malady. The blow fell the more heavily upon his family and friends and upon his scientific colleagues, because his fine constitution, combined with a manly vigor of body and mind, had seemed to defy disease and to promise years of activity.

Educated as an engineer, he showed from boyhood a predilection for natural history. He was a favorite student of Professor Agassiz, and when only a lad of seventeen had shared his labors on the glacier